



Dipartimento di scienze agrarie,
alimentari e agro-ambientali (DiSAAA)



Laboratorio di Studi Rurali Sismondi



associazione Alessandro Bartola
studi e ricerche di economia e di politica agraria

Convegno Annuale

**I SERVIZI ECO-SISTEMICI:
NUOVI APPROCCI PER LA
GESTIONE SOSTENIBILE
DELLE AREE RURALI**

**PISA 3 DICEMBRE 2012
Ore 9.00**

Aula Magna
Facoltà di Agraria - Università di Pisa
Via del Borghetto, 80

Con il Patrocinio di:



PROVINCIA DI PISA



POLITECNICO
DI TORINO



UNIVERSITÀ
DEGLI STUDI
DI TORINO

Dipartimento Interateneo di Scienze, Progetto e Politiche del Territorio

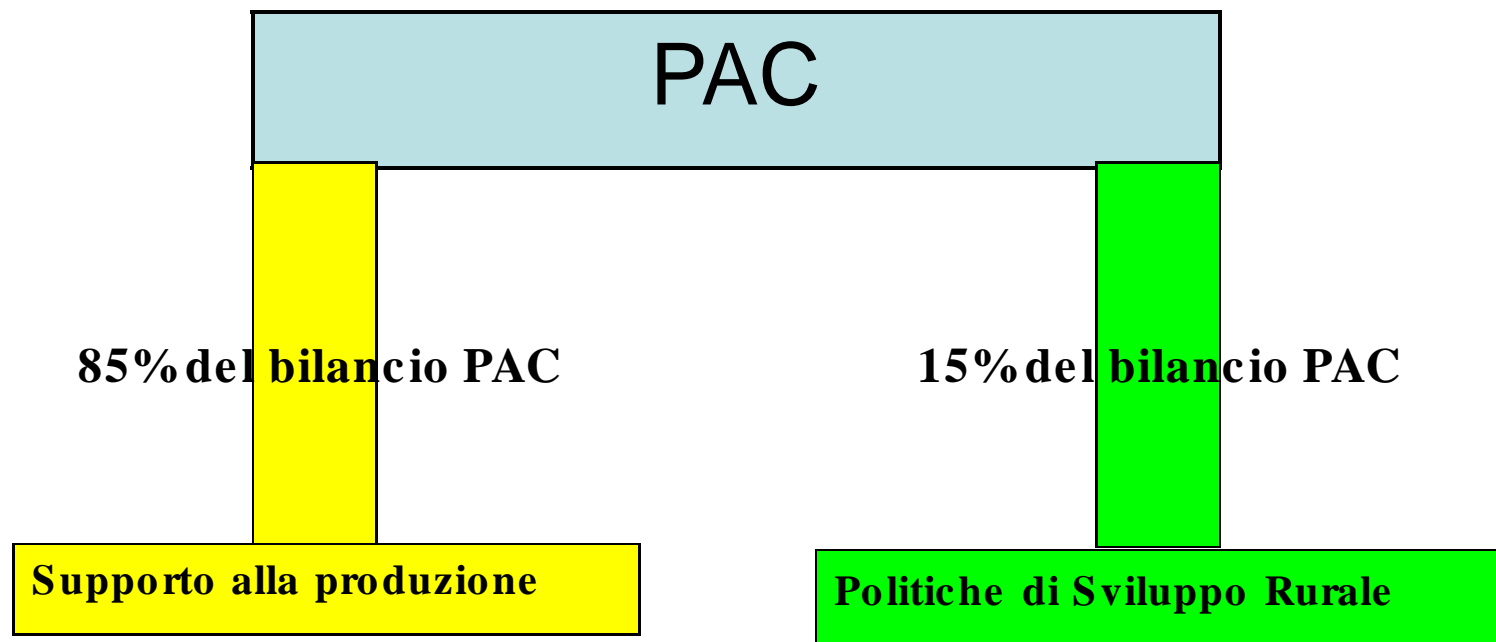
Valutazione del contributo delle misure agro-ambientali alla fornitura di servizi eco-sistemici: il caso del Piemonte

**Carlo Rega e Agata Spaziante – DIST – Politecnico
di Torino**

agriregionieuropa

La Politica Agricola Comunitaria (PAC)

- La Politica Agricola Comunitaria (PAC) è una delle più importanti dell'Unione Europea;
- Alla PAC è assegnato il 34% del totale del budget della UE: si basa su due “pilastri”, supporto economico alla produzione e sostegno allo sviluppo rurale.



Asse 2: misure agroambientali

- Supporto finanziario fornito agli agricoltori per l'utilizzo di pratiche agricole meno impattanti o la realizzazione di azioni con effetti ambientali positivi

La valutazione e il monitoraggio degli effetti ambientali del PSR: criticità emergenti

Diverse ricerche e un recente rapporto ufficiale della Corte dei Conti Europea (ECA, 2011) segnalano alcune criticità ricorrenti legate all'attuazione di misure agroambientali e al monitoraggio del PSR:

- Il QCMV non appare pienamente adeguato a misurare i benefici ambientali delle misure in relazione al loro costo
- I PSR non sono abbastanza selettivi nell'individuare le domande da finanziare in riferimento alle priorità ambientali e territoriali individuate
- La distribuzione territoriale delle misure non è ottimale in relazione ai benefici ambientali attesi

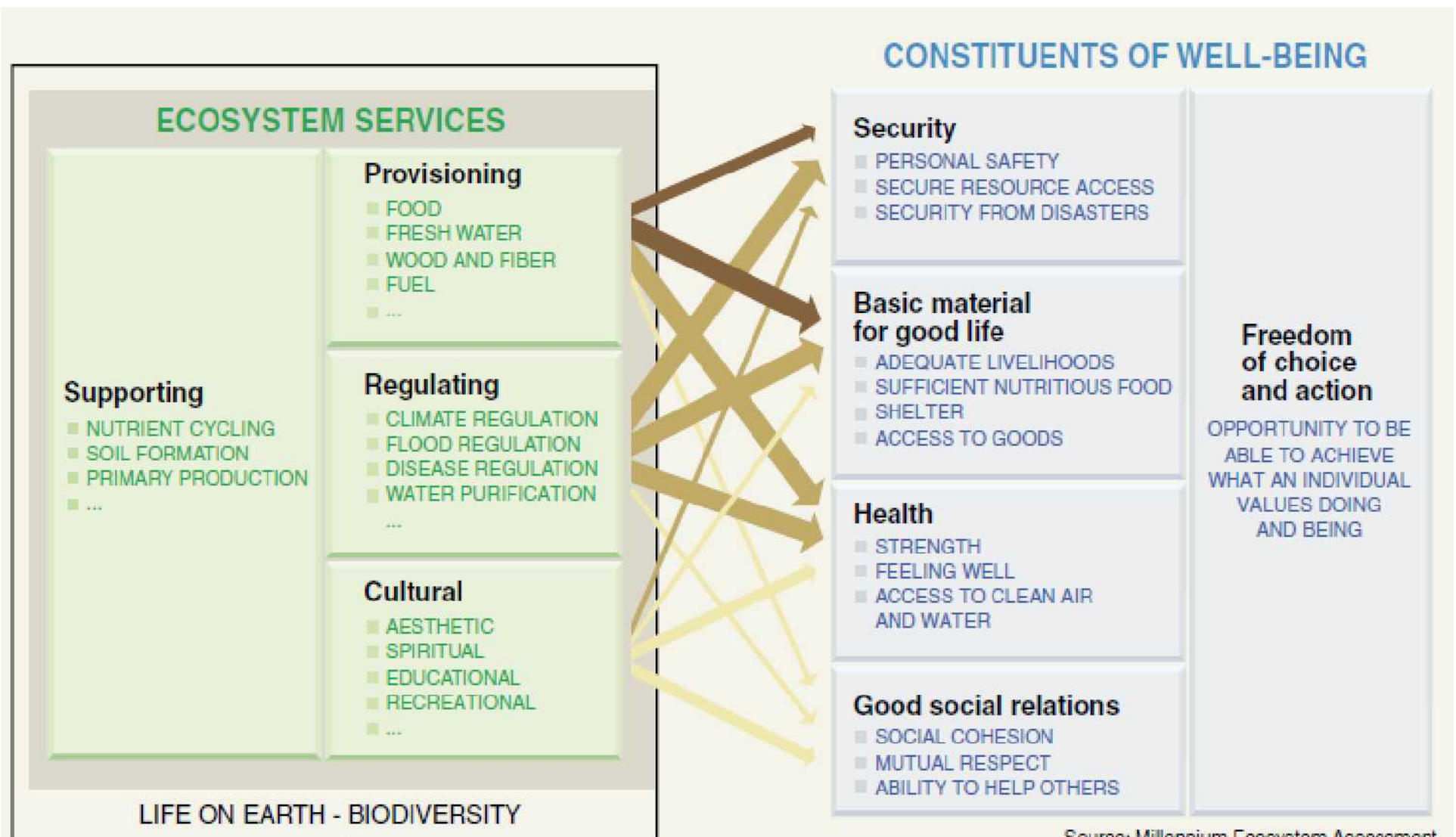
La valutazione e il monitoraggio degli effetti ambientali del PSR: sfide e proposte

È necessario passare da:

sistema di valutazione basato su dati prevalentemente riferiti al livello di adesione dei beneficiari alle misure (ad es. ha di terreno su cui agisce la misura)



A un sistema basato sulla valutazione quantitative dei servizi ecosistemici forniti dall'agricoltura



Source: Millennium Ecosystem Assessment

ARROW'S COLOR
Potential for mediation by socioeconomic factors

- Low
- Medium
- High

ARROW'S WIDTH
Intensity of linkages between ecosystem services and human well-being

- Weak
- Medium
- Strong

Domanda di ricerca:

- 1) individuare le relazioni fra misure agroambientali e servizi ecosistemici
- 2) Come valutare quantitativamente i cambiamenti nei livelli di servizi ecosistemici a seguito dell'attuazione delle misure agroambientali
- 3) Cosa questo richiede in termini di sforzi organizzativi e cambiamenti negli attuali sistemi di raccolta e gestione dati

Caso studio: PSR della Regione Piemonte

Misure indagate:

- 123.1 aumento del valore aggiunto dei prodotti agricoli
- 214.1 sistemi di lotta integrata
- 214.2 agricoltura biologica
- 214.4 carbonio organico nel suolo
- 214.6 sistemi pascolive estensivi

	Measures	123.1 Increase value of agriculture products	214.1-2 Integrated and organic farming
Provisioning services	Freshwater	+++ purchase of facilities to recycle water used in cultivation or production processes, decreasing the total amount of water consumed..	+ + crop rotation: autumnal and winter cultivation do not require significant water inputs
Regulating services	Air quality regulation	+++ purchase of equipment or machinery with lower emission, higher efficiency or substitution of old machinery	+ lower demand of fertilizers and pesticides → decrease of manufacturing emissions
	Carbon sequestration	+++ purchase of equipments or machineries with lower CO ₂ emissions	+ optional actions (grass covers, turfs) increase the amount of CO ₂ sequestered
	Water regulation	-- The actions finance the building of new agriculture structures → increased soil sealing and reduce water infiltration	+ optional actions (grass cover, turf) decrease surface runoff and improve soil water retention capacity
	Erosion regulation		+ optional actions (grass cover, turf) decrease surface runoff and improve soil water retention capacity
	Water purification	+++ purchase of facilities to purify water used in cultivation or production processes.	+++ lower use of pesticides and consequent percolation into the watershed
	Pest regulation		+++ pest control provided by natural enemies is enhanced through integrated pest management
	Pollination		+++ decreased use of harmful chemical for insects increase the presence of pollinators
Cultural services	Aesthetic values	+ renovation of traditional or historic buildings	++ crop rotation increase the variety of the patches of the agro-mosaic and counter the effect of Landscape homogenization

	Measures à	214.3 Soil organic carbon	214.6 Pasture extensification
Provisioning services	Genetic resources		++ by supporting alpine pastures, the measure fosters the conservation of autochthonous cow breeds, typical of the alpine habitat
	Biochemicals, natural medicines, pharmaceuticals		+ It maximizes the biodiversity of alpine pastures plants (including natural medicines, e.g. <i>Gentiana lutea</i> L., <i>Euphrasia rostkoviana</i>), since the constant ruminating prevents the domination of a limited number of species as result of interspecific competition.
Regulating services	Air quality regulation	+ decreased demand for urea and lower manufacturing emissions	
	Climate regulation through carbon sequestration	++ increase CO ₂ in the soil is sequestered by the atmosphere	++ a correct management of pastures keep the vegetal biomass at the maximum growing rate, which increase its capacity as CO ₂ sink
	Water regulation		+++ adequate pasture management improves the maximum water-holding capacity of terrains à decrease surface runoff, flood risk mitigation
	Erosion regulation	+++ reduced susceptibility of the soil to detachment; increases of infiltration, which reduces runoff and erosion	++ adequate pasture management allows increased development of plant roots and enhances their function in counteracting soil erosion
	Water purification	++ nutrients and chemicals are more adsorbed by soils rich in organic carbon à decreased leaching to groundwater is	
	Pest regulation	++ soil CO ₂ is essential for microorganisms at the base of ecosystems, and thus for natural enemies used in integrated pest management	
	Pollination		++ enriched vegetal biodiversity on pastures increases the number of pollinators available for other crops
Cultural services	Spiritual and religious values		++ Pastures represent the most distinctive features of the Alpine landscape. Many cultural traditions in Piedmont are related to the alpine way of life and its traditional forms of production. The measure contributes to preserve this cultural heritage and related material assets (typical buildings, stables, paths, rural villages)
	Aesthetic values		++ Alps are one of the main attractors of ecotourism in Piedmont. The preservation of the typical pasture landscape also contribute to the different linked activities: production of fine meat or cheese, Ecotourism, paths
	Recreation and Ecotourism		

Quantificazione

Measures 214.1 and 214.2 Integrated pest management and organic farming

Fresh water	<ul style="list-style-type: none"> • Quantifiable by combining available data on area and type of cultivation pre-crop-rotation and data from literature on average per ha of water needs of different types of cultivation deriving from crop-rotation
Air quality regulation	<ul style="list-style-type: none"> • Fertilizers: quantifiable with current data considering an average decrease of 30% of nitrogen inputs and combining this data with manufacturing emission factors of different types of fertilizers. • Pesticides: not quantifiable as restrictions do not concern quantitative thresholds, but only on number of applications and allowed active principles.
Carbon sequestration	<ul style="list-style-type: none"> • The increase of CO₂ sequestration is quantifiable by combining the total area on which grassland cover is applied (available) with information from literature on the average carbon sequestration capacity of grassland compared to previous covers
Water regulation	<ul style="list-style-type: none"> • Decrease in surface runoff quantifiable by combining available information (see 'fresh water') with data from literature on the increase in water retention capacity of grassland compared to naked soil, and levels of precipitation
Erosion regulation	<ul style="list-style-type: none"> • Soil erosion prevented can be estimated with available data on optional actions (soil cover with grassland) using existing models (e.g. the RUSLE method, Lane et al., 1997) • Values of the model parameters for different types of cultivations and covers conditions affected by the measure are provided by the literature)
Water purification	<ul style="list-style-type: none"> • Total amount of nitrogen not discharged into the soil is quantifiable (see air quality regulation above). • Pesticides: not possible under current regulations (see air quality regulation above). • It appears to not be feasible to ask for additional information from farmers given current payment conditions. • Records provided by farmers should be integrated with comparative sample field surveys in enrolled and unenrolled farms and used to populate existing indexes of environmental impacts of pesticides, as the EIQ (Kovach et al., 1993).

Discussione

- Numerose relazioni identificate fra misure agroambientali e servizi ecosistemici
- In diversi casi è possibile fare una valutazione quantitativa senza eccessivo dispendio di risorse aggiuntive combinando dati già raccolti con analisi desktop o cartografiche (GIS)

Discussione

- In altri casi invece stime attendibili sono possibili solo tramite studi di campo e biomonitoraggio (es. effetti sulla biodiversità)
- Richiedere informazioni aggiuntive agli agricoltori non appare sempre fattibile nelle attuali condizioni (costi di transizione)

Vantaggi nel riprogettare i sistemi di valutazione e monitoraggio basandoli sui servizi ecosistemici

- Consentono forme di gestione adattativa delle misure agroambientali durante la fase di implementazione dei PSR (7 anni)
- Maggiore trasparenza nella valutazione, più immediato valutare il “valuer for money”
- Più immediata identificazione dei trade-offs
- Maggiore facilità comunicativa al pubblico e policy-makers

DIST



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